

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

September 10, 2009

TO: Internal File

THRU: James D. Smith, Permit Supervisor *DS 9/12/09*

THRU: Dave Darby, Team Lead *[Signature]*

FROM: Priscilla Burton, Environmental Scientist III, Soils. *PWB by SAS*

RE: Lila Canyon Design Changes, Utah American Energy Inc., Horse Canyon Mine, C/007/0013, Task #3351

SUMMARY:

On July 15, 2009, one year after the initial amendment was received, the Permittee provided a response to the initial review of Task 3017, change in design for the Lila Canyon surface facilities (previously reviewed under Task 3017). Substantial construction has occurred at the site in the interim, beginning in December 2008. The construction has been a hybrid of that described in the MRP and that described in the July 2008 amendment. Inspection Report #2019 describes the progress of construction as of May 2009.

The cover letter with the amendment incorrectly describes the change in acreage of undisturbed lands within the disturbed area. The change in disturbed and undisturbed acreage is correctly stated on page 13 of Chapter 1. The new designs are described in Appendix 5-4 and 5-7 of the amendment and call for increasing disturbed area from 25.3 acres to 34 acres and a 50% reduction in the islands of undisturbed land within the disturbed acres from 17.3 acres down to 8.7. The expansion will accommodate a larger coal stockpile as shown on Plate 5-8. The design changes call for soil salvage from only 2.65 additional acres (Available Soil Resources Table, Chap 2. pg. 9), although the disturbed area will increase by 8.6 acres. The topsoil salvaged will increase to 66,000 loose cubic yards.

The application is not recommended for approval. The following six deficiencies have been identified:

R645-301-122, Please provide Appendix A Drawings for the Wastewater Disposal System report dated February 2009 provided with the application. [PWB]

R645-301-142 and R645-301-234.230, Cryptogams salvaged in December 2007 have been stored in open buckets in a cool, dark location, for use on the topsoil stockpiles. These cryptogams should be dispersed on the finished (north) side of the topsoil pile during the fall 2009 as described in the MRP Section 234.230 along with the hmulching and seeding to protect the stockpiled topsoil. This operation must be completed before freezing temperatures limit the use of hydrospray. • The effect of long term storage on the viability of the cryptogams is unknown, so additional buckets should be collected from currently undisturbed areas prior to future soil salvage for the remainder of the topsoil stockpile as described in the MRP Section 232.100. [PWB]

R645-301-251, The Permittee has opted to preserve 8.7 acres of undisturbed landscape within the disturbed area perimeter. By the statements made in response to Task 3017, UEI accepts responsibility and potential consequences of this decision. Without delay, the undisturbed islands described in this application should be marked with signs (as described in the MRP Section 231.100) and protected by a 20 ft buffer zone (MRP, Section 234.220); the undisturbed islands should be protected with rock barriers (at the 20 ft buffer zone location) and incidental rock distribution (as shown on Plate 5-2). [PWB]

R645-301-251 and -301-252, Section 232.500 of the MRP- PART B states that subsoil from 12 – 30 inches from cut areas will be used as fill material during operations. This has been occurring. However it is not being placed where it can be recovered. It forms the base of the coal storage and warehouse pads. This preferred subsoil has not been mapped and is lost in the fill. The plan should describe sampling and testing of graded subsoil materials prior to final topsoil application. Sampling should follow protocol described in the Division Guidelines for Topsoil and Overburden and analysis for parameters described in Tables 3 and 7 of the Guidelines. [PWB]

R645-301-121.200 and -512.210, and -512.220, Plate 2-4 illustrated the location of rock slope waste and refuse, but this map has been deleted. Plate 2-3 does not show the locations of refuse storage and rock fill storage although these are indicated in the legend. [PWB]

R645-301-232.600, and -512.100, -512.120 and -121.100, The construction is occurring in stages and will continue on through 2010. Since Plate 5-2 Surface Area, Official Disturbed Boundary Map, does not reflect existing, interim site conditions, construction phases should be described in the MRP along with a commitment to provide a map at the completion of each phase of construction, beginning with the current site conditions, that illustrates existing mine facilities, and areas remaining to have topsoil and subsoil salvaged and provides a tally of the currently disturbed and undisturbed acreage within the disturbed area perimeter such that the Permittee and Division inspectors have a clear understanding of future topsoil and subsoil salvage requirements. [PWB]

R645-301-731.300, Appendix 5-7 states that there are no acid or toxic forming wastes at the site. The information provided to date from rock sampling indicates otherwise and this statement should be removed from Appendix 5-7, p. 1. [PWB]

R645-301-553.350, The application alternately describes off-site disposal of all acid- or toxic-forming mine waste (Section 553.200 and 553.300 and App. 5-7, p.1) or transport to the Wildcat Loadout refuse pile (Section 528.300) or burial in a disposal area (Section 536) according to the plan provided in App. 5-7. Transfer to the Wildcat loadout would require an amendment to the Wildcat plan that currently describes adequate cover for existing site requirements. [PWB]

TECHNICAL ANALYSIS:

GENERAL CONTENTS

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

Appendix 1-3 Part B contains violation information, which is current through April 2009.

Findings:

The information provided meets the reporting requirements.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

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The 42.6 acre disturbed area perimeter boundary is outlined on Plate 5-2. This entire perimeter of the disturbed area has been bonded (Section 521.163 and Ex. B Reclamation Agreement), but new designs call for the disturbance of only 33.9 acres within that perimeter (an increase of 8.6 acres from the previous design). The new design reduces by 50% the acreage of undisturbed land within the perimeter boundary from 17.3 acres down to 8.7. This undisturbed land is on the southern perimeter boundary to the east, south and west of the coal stockpile, which is to be enlarged from 27,000 tons to 200,000 tons of open storage (Chap 5, pg. 13).

Findings:

The information provided meets the requirements for permit area.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

The MRP- Part B meets the requirements for soil survey and characterization. UEI discusses soil resources within the Lila Canyon Extension in Chapter 2, Sections 210 through 224 of the MRP- Part B.

Daniel Larsen, a Professional Soil Scientist with Environmental Industrial Services (E.I.S.) conducted an Order I soil survey of the disturbed area in August of 1998. The Soil Survey is found in Section 3.2 of Appendix 2-3. The survey contains soil descriptions, soil pedon descriptions, a soil-salvage suitability analysis, laboratory soil testing data, field soil profile-descriptions, soil and landscape photographs, a soil map, and a salvageable-soils map. Mr. Larsen performed all mapping and soil survey work according to the standards of the NRCS's National Cooperative Soil Survey. There has been no further survey work done accompanying this application for detailed design changes (Task 3017).

Soil Identification and Description, and Productivity

The predominant soil classification is Strych fine sandy loam. From the soil description sheets in Appendix 2-3 and Plate 2-2, Detailed Soils Map of the Mine Facilities Site, the Division notes that the canyon bench holds deep colluvial soils, stabilized from wind erosion by a surface layer of biological soil crusts, dried plant litter, boulders and live plant cover. The topsoil (A-horizon layer) varies from three to 26 inches deep due to position on the slope. The B-horizon stretches from 31 – 60 inches in the profile and is a zone of carbonate accumulation. Sandstone bedrock underlies the soils, except at the location of the fan portal where shale and

burned coal cover the sandstone rock layer. Surface soils are subject to extremes of temperature (Sec 3.2, Appendix 2-3).

The disturbed area vegetation is primarily pinyon-juniper and grass-shrub communities (Plate 3-2). Productivity estimations made in 2003 placed the disturbed area productivity at 350 lbs/acre and the grass/shrub reference area at 450 lbs/ac, low values due to drought (see Appendix 3-2 letter dated 2003).

Soil Characterization

Soil pedon descriptions on standard NRCS forms are provided in Appendix D within Appendix 2-3. Soil horizons were sampled and analyzed according to Division guidelines for topsoil and overburden. Table 3.21 in Appendix 2-3 provides generalized soil properties, including percent surface stones and boulders. Soil sampling locations are shown on Plate 2-2, Detailed Soils Map of the Mine Facilities Site. Intermountain Laboratories, Inc analyzed the soil samples. Laboratory data sheets are found in Appendix C of Appendix 2-3.

Appendix 2-3 contains soil macronutrient status information analyzed by BYU Soil and Plant Analysis Laboratory May 1, 2003, providing a reference for comparison with the nutrient content of the redistributed topsoil at final reclamation.

Since the A horizon is less than six inches deep, the topsoil recovered will be a mix of both the A and B horizon soils, in accordance with R645-301-232.200. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). A calcic horizon was verified in soil pedons LC1, LC5 and LC6 which will provide a marker for soil salvage depth. The percent rock content within the proposed facilities area is high according to the 1988 Division guidelines, however it is not a deterrent to soil salvage. Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

Findings:

The information provided meets the environmental soils resource information requirements of the R645- Coal Rules.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

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Alluvial Valley Floor Determination

The information provided in the plan was adequate for the Division to determine that there is no probable existence of an alluvial valley floor. There has been no change to the information provided with the detailed design changes reviewed under Task 3017.

This section summarizes the land use, soil, plants, geology, surface- and ground-water information reviewed by the Division in making the findings required under R645-302-320.

The Lila Canyon Extension is in the western Book Cliffs escarpment. Numerous small seeps and springs exist within and adjacent to the permit area (Section 731.220). Steeply dipping joints transmit ground water from the surface (Section 6.5.3.5) as illustrated in Figure VI-5. The surface expressions of the faulting are grabens and draws. The general strike of the beds in the permit area "B" is N22°W dipping at 11% to greater than 16% towards the East (Figure VI-3 and Plate 7-1-B and Section 6.4.2, Section 6.5.3.3).

Water inflow from the Geneva Tunnels is anticipated (Section 6.6.1). Water inflow associated with fault or fracture systems are possible, but not expected to be significant. The Sunnyside sandstone member of the Blackhawk formation contains the two coal seams of interest: Upper Sunnyside and Lower Sunnyside Seams. The sandstone beneath the Lower Sunnyside coal seam is considered to be a zone of groundwater accumulation (Section 6.4.1). Historical records for the Geneva Mine (now known as the Horse Canyon Mine) indicate that the mine was dry until the Sunnyside Fault was intercepted. This suggests that as mining progresses down dip, "substantial" water may be encountered, but this water will be isolated from the surface recharge zone (Section 6.6.3.1) and indications are that the Sunnyside Fault will not be encountered within the Lila Canyon Extension (Section 6.5.3.3).

The Mancos Shale forms the slopes below the base of the Book Cliffs, overlain in places by pediment deposits (Section 6.4.1 and Plate 6-1). In the permit area, drainages flow in response to snow melt and precipitation events (Section 731.220 and Plate 7-1). Coleman Wash receives the Lila Canyon drainage. Grassy Wash and Marsh Flat Wash collect the flow from the Mancos slopes further south. Little Park Wash channels the flow on the plateau above. There is no valley holding a perennial stream in the permit area (Section 724.700).

Order III soil survey (Plate 2-1) indicates that the soils on the plateau in Little Park Wash are Neto Fine Sandy Loam (Section 220.200). This soil is comparable to the Glenberg soil described in the published Carbon County Soil Survey, according to Leland Sasser, Soil Scientist and Survey Project Leader with the NRCS, Price Field Office, Utah (consultation June 5, 2001). Plate 3-2, Vegetation indicates that the dominant species growing on the plateau in the vicinity of Little Park Wash are Atriplex, Artemesia and Elymus, none of which are wetland species.

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Little Park Wash falls within the Little Park grazing allotment (Plate 4-2). The land use is unimproved rangeland and wildlife habitat. There is no farming activity upstream or downstream of the permit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor. Based on the information provided in the plan, in accordance with R645-302-321.100, the Division determines that there is no probable existence of an alluvial valley floor.

Findings:

Based on the information provided in the plan, in accordance with R645-302-321.100, the Division determines that there is no probable existence of an alluvial valley floor.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

The Natural Resources Conservation Service (NRCS) determined in 1998 that there are no Prime Farmlands at the proposed disturbed site (see Appendix 2-1). There has been no change to this information with the design change amendment Task 3017.

Findings:

The Division concurs with the NRCS determination made in 1998 that there are no Prime Farmlands at the proposed disturbed site.

OPERATION PLAN

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

Analysis:

First year production from the mine is estimated to be 200,000 tons, increasing in the second through fifth year to between 1,000,000 and 1,500,000 tons. Long wall mining could be utilized to generate as much as 4,500,000 tons a year (Section 523).

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Appendix 4-3 contains correspondence between UEI and the Department of Environmental Quality, Division of Air Quality (DAQ), dated 1999. An Approval Order (DAQE-702-99) was issued August 27, 1999. A revised Approval Order (DAQE-AN0121850002-08) was issued October 23, 2008, in which the DAQ approves the increased acreage for the open coal stockpile.

Findings:

The information provided meets the requirements for Air Quality compliance.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

This design change amendment (Task 3351) revises pages 9, 10, 12, & 14 of Chapter 2. Plates 2-1 and 2-2 show a slight change in the disturbed area boundary. Plate 2-4 was deleted. Plate 2-3 illustrates the new mine site configuration. The new configuration increases the disturbed acreage and results in increased topsoil salvage and greater volume in the topsoil stockpile, as described below.

The disturbed area perimeter encloses 42.6 acres (Section 232.100, Section 411.110, Section 542.200, Appendix 5-8). The 42.6 acre permit area is outlined on Plate 5-2. The entire permit area is described in bonding documents (Section 521.163), however, only 33.9 acres will be disturbed, leaving 8.7 acres of undisturbed islands within the disturbed area boundary, down from 17.3 acres previously described as undisturbed. The remaining undisturbed land is shown on Plate 5-2 on the southern perimeter boundary to the east, south and west of the coal stockpile, which is to be enlarged from 27,000 tons to 200,000 tons of open coal storage (Chap 5, pg. 13).

[NOTE: The Available Soil Resources Table (Section 232.100) indicates that there are potentially 48.23 acres of surface disturbance. This table was taken from the soil survey and does not accurately reflect UEI's intention to include 42.6 acres of disturbance within the permit area boundary.]

A field check of Plate 5-2 was undertaken on September 9, 2009. Plate 5-2 presents the final site development plan, but does not reflect the present interim site conditions. Although R645-302-232.600 requires that all topsoil be removed before there is any blasting, there remain many lands within the disturbed perimeter that remain to have topsoil salvaged during the next phase of construction. For instance, the land in the proposed locations of the substation, the truck loadout, the drain field, and the slopes between the ROM coal stockpile and storage yard have not yet been stripped of topsoil. The topsoil stockpile is approximately 1/3 its final size.

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The coal pad and warehouse/materials pads are also 1/3 their final size. At present, there are many acres of land remaining to have topsoil salvaged. The number of acres remaining to be salvaged should be tallied and provided to the Division.

Since the Division has had an inspector at the site weekly for this entire year, and still construction at the site is not following the approved plan, there appears to be a need for better information. There has been encroachment of the outslope of the rock slope material onto undisturbed lands and encroachment of traffic in the sediment pond #2 area on undisturbed islands. There has been no salvage of subsoil from these locations. The Division therefore, requests that the Permittee produce a map that shows the areas of future topsoil and subsoil salvage and the facilities currently constructed, such that there is a clear understanding of which areas must have topsoil salvaged prior to further construction. Such a map should also show areas of subsoil salvage for use in final reclamation.

These remaining undisturbed acres represent approximately 26% of the acreage within the disturbed area perimeter. Since, vegetation and soils of undisturbed lands will likely be subject to impacts from fugitive dust and coal fines blowing from the increased coal stockpile acreage, and since the soil type to be impacted is DSH and XBS, having 18 and 12 inches of salvageable soils, respectively, the Division advised topsoil salvage from all acreage within the disturbed area boundary shown on Plate 1-2, as required by R645-301-232.100, with the exception of soil types which may fall within the exclusion of R645-301-232.700, see Task 3017 memo. However, the Permittee has declined this advice and will preserve the landscape unless coal fine deposition occurs. The undisturbed islands will be monitored as described on page 16, Chap. 2. By the statements made in response to Task 3017, UEI accepts responsibility and potential consequences.

Islands will be marked with signs (Section 231.100) and protected by a 20 ft buffer zone (Section 234.220). The undisturbed islands will be protected with rock barriers and incidental rock distribution (Plate 5-2). This will not eliminate the need for the Divisions recommendations to protect the slopes beneath the conveyor from incidental coal fine deposition (see the Surface Facilities section of this TA).

The Available Soil Resources Table in Section 232.100 lists 27.95 acres of topsoil salvage. The difference between the area disturbed (33.9 acres) and the area of soil salvage (27.95 acres) is 5.95 acres, which represents the acreage of rocky slopes beneath the portal bench that are inaccessible to soil salvage (Section 232.710).

For the purposes of removal, Section 231.100 of the MRP- PART B defines topsoil as all soil from the surface down to eighteen inches. Plate 2-3 Soil Salvage and Replacement provides guidance for the topsoil removal, illustrating removal of eighteen inches of topsoil from the central and northwest portion of the disturbed area; twelve to eight inches being removed from the roadway; twelve to eighteen inches removed from the sediment pond location; and eight to

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eighteen inches removed from beneath the coal stockpile and coal storage bin.

Soils will be removed from all disturbed areas including stony areas to a depth of eighteen inches or to shale (Sections 232.100 and 232.300) with the following exceptions (Section 232.700):

- The RBL and RBT soils on steep rocky slopes within the disturbed area below and between the conveyor and coal storage pile (approximate acreage requested).
- The two bents to be constructed for the conveyor.
- The area of topsoil storage (topsoil will be removed from the access road to and around the topsoil pile, but not from beneath the topsoil pile (Section 232.100)).

Undisturbed islands of soil will be marked with signs (Section 231.100) and protected by a 20 ft buffer zone (Section 234.220). The undisturbed islands will be protected with rock barriers and incidental rock distribution (Plate 5-2).

UEI will install an enclosed conveyor (Section 232.710) in an attempt to keep the native soils (beneath the conveyor) free of coal accumulations. Installation of jersey barriers will protect the slope from encroachment by the coal stockpile. UEI will monitor the undisturbed soils quarterly for coal fine deposition (Section 234.220 MRP – Part B, see also discussion under Support Facilities in this TA).

Soils to be salvaged are estimated to be 56,000 bank CY (Table of Available Soil Resources in Section 232.100). The table divides salvageable soil by map unit type. Soils will be removed from the 27.95 acres to be disturbed with a crawler-tractor, grader, front-end loader, and/or trackhoe.

To protect the soil resource, UEI has committed to handling the soils at an optimum moisture content, when the soils are loose and friable (Section 231.100), adding moisture or allowing the soils to dry as needed.

There will be a qualified soil scientist to oversee the soil salvage, construction of subsoil storage site, and reclamation of the site (Sections 231.100 and 232.100). UEI further commits in Section 232.500 to maintain records of materials removed and placement of materials either in the topsoil storage pile or in the fill. Soil pedestals will be left to verify soil removal depths (Section 232.500).

Storage of the approximately 66,000 loose cubic yards of topsoil (loose cubic yards is equal to 56,000 bank cubic yards multiplied by the swell factor of 1.18) will be in a stockpile (Section 232.100 Available Soil Resources Table) with the approximate dimensions 31 ft high X 350 ft long X 250 ft wide (Section 232.100), with 2h:1v side slopes. Figure 1 and Plate 5-2 provide information on proposed construction of the topsoil stockpile.

Topsoil stockpile will be an Alternate Sediment Control Area (ASCA) protected from upstream flow by drainage ditches (design shown in Appendix 7-4). The stockpile will be loosely piled with a rough, irregular, pitted surface retain moisture and reduce erosion (Sections 231.100 and 231.400). The Division notes that this practice is described in the Practical Guide to Reclamation (DOGM, 2000), available at <http://dogm.nr.state.ut.us>.

The topsoil will be retained in place with the use of berm/ditches or silt fences surrounding the pile. The stockpile will be mulched and seeded in the fall (after September 15) using the mix in Table 3-4 (Section 231.400). Table 3-4 is a mix of native grasses, forbs and shrubs. Species in the mix should control erosion yet maintain the natural beauty of the landscape. Section 231.100 and Section 231.400 indicate that if seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding. According the Mr. Marshall the north side of the topsoil stockpile is at its final configuration, and further additions to the pile will occur to the south end of the pile. The north side of the topsoil pile was roughened in the spring of 2009. We discussed the application of seed, cryptogam and mulch to this final side of the topsoil stockpile in the fall of 2009 (Price Field Office meeting September 9, 2009).

The surface layer of soil is valuable, for it contains seeds, cryptogam filaments, other microorganisms, organic matter, elevated levels of nitrogen and phosphorus. UEI has committed to gathering eight, five gallon buckets of cryptogamic soil separately from the remainder of the topsoil salvage (Section 232.100). UEI proposes to try to establish cryptogams on the topsoil stockpile by using the cryptogamic soil as an additive to each load of wood fiber mulch hydrosprayed on the surface of the gouged topsoil pile. The cryptogamic soil will be mixed with wood fiber mulch at a rate of 1% by volume (Section 234.230). [Note: The percentage of cryptogamic soil to be added to the hydromulch should probably be on the order of 1% by volume. The area of the proposed topsoil stockpile is 246 ft X 146 ft with 2:1 side slopes or about one acre. Approximately 4,000 gallons of hydromulch spray are required for one acre, therefore eight, 5 gallon buckets of screened cryptogamic soil (through a ¼ inch sieve) will be added to the tank to create a 1% concentration (conversation between Priscilla Burton and Bill Lee, Skyline Reclamation, on May 27, 2004).] The biologic soil crusts established on the topsoil pile will be later harvested for inoculation of the reclaimed site.

The Division previously recommended that the topsoil pile receive an initial irrigation after the cryptogam/mulch is sprayed onto the topsoil surface, to ensure good contact and growth of the cryptogams. This recommendation was based upon Jayne Belnap's work, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. UEI has declined to irrigate. Since the research on this issue is limited, the Division will not press the issue, unless further evidence of the benefits of irrigation in establishing transplanted cryptogam filaments becomes known.

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Storage of topsoil from the topsoil storage area access road will be in berms around the topsoil stockpile (Section 232.100). Storage of topsoil from the fan portal will be in a berm around the fan disturbance (Section 234.100). Plate 5-2 shows the location of the topsoil berm at the fan site. To avoid contamination with rock dust, the berm will not extend in front of the fan. The bermed fan portal soil will be protected with a silt fence and vegetated (Section 234.100).

Subsoils

Appendix 2-3 Plate App. 2 provides guidance for depth of subsoil removal when used for construction. MRP-Part B provides a commitment to develop As-Built maps showing where subsoil materials have been used as fill material (Section 232.500), including thickness of topsoil, subsoil, and substrata. During meetings to discuss this technical analysis on November 24, 2008, and again on September 9, 2009 and October 14, 2009, the Permittee was reminded of the above commitments in the plan that pertain to site construction.

The Division received comments on the need for soil-borrow areas. Topsoil will be recovered from all disturbed areas (from a minimum depth of 6 inches from RBT soil up to 18 inches from VBJ, SBG and DSH soils). The total recovery of topsoil is estimated at 56,000 bank cubic yards. On the average, this represents a replacement depth of 15 inches over the proposed 25 disturbed acres. An average recovery depth of 15 inches from the site will provide an adequate supply of topsoil for final reclamation. The Order 1 Soil Survey suggests subsoils are also suitable for plant growth down to a depth of 48 inches (Appendix 2-3). In addition the location of subsoil with suitable reclamation characteristics will be mapped for ease of recovery and replacement during reclamation (Section 232.500, Section 241, Section 242.100). These subsoils were to be placed where they can be recovered and utilized to increase the rooting depth at reclamation.

There appeared to be no need to develop a soil borrow area at the time of initial permitting. However, during a meeting at the Price Field Office on September 9, 2009 and on October 14, 2009, Jay Marshall was reminded of the commitment to provide the location of suitable subsoil fills on a map (Section 232.500, Section 241, Section 242.100). Mr. Marshall has indicated that the subsoil is being placed as described in the cut/fill estimates (personal communication 10/15/2009). Section 232.500 of the MRP- PART B states that subsoil from 12 – 30 inches from cut areas will be used as fill material during operations. This has been occurring. However it is not being placed where it can be recovered. It forms the base of the coal storage and warehouse pads.

Specified recovery depths for subsoils are described in Section 232.700 for soil types SBG, DSH, and VBJ, based upon recommendations found in Part 3.4 of Appendix 2-3 Soil Inventory. The MRP described the subsoil recovery depth in inches of salvageable subsoil remaining after topsoil removal. Thus, for SBG soil the 30 inch removal thickness would come

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from between 18 inches and 48 inches in the profile. This preferred subsoil has not been mapped and is lost in the fill. NOV10045 was written on 9/23/2009 failure to follow the approved plan.

The MRP states that subsoil will be used as fill underneath parking areas, roads, buildings, and storage sites. These subsoils will be protected during operations by asphalt, concrete, or gravel over an impervious membrane (Section 232.500). Section 232.500 further B indicates that upon reclamation, subsoils found to be contaminated with oil, grease, or salts through visual evaluation will be hauled to a landfill site.

Findings:

The following deficiencies are identified with the application:

R645-301-142 and R645-301-234.230, Cryptogams salvaged in December 2007 have been stored in open buckets in a cool, dark location, for use on the topsoil stockpiles. These cryptogams should be dispersed on the finished (north) side of the topsoil pile during the fall 2009 as described in the MRP Section 234.230 along with the hymulching and seeding to protect the stockpiled topsoil. This operation must be completed before freezing temperatures limit the use of hydrospray. • The effect of long term storage on the viability of the cryptogams is unknown, so additional buckets should be collected from currently undisturbed areas prior to future soil salvage for the remainder of the topsoil stockpile as described in the MRP Section 232.100. [PWB]

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R645-301-251, The Permittee has opted to preserve 8.7 acres of undisturbed landscape within the disturbed area perimeter. By the statements made in response to Task 3017, UEI accepts responsibility and potential consequences of this decision. Without delay, the undisturbed islands described in this application should be marked with signs (as described in the MRP Section 231.100) and protected by a 20 ft buffer zone (MRP, Section 234.220); the undisturbed islands should be protected with rock barriers (at the 20 ft buffer zone location) and incidental rock distribution (as shown on Plate 5-2).

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal Of Noncoal Mine Wastes

The PAP indicates in Section 542.640 that a minimum of two feet of cover will be placed over sand and gravel road surfacing materials and asphalt will be disposed off-site. Concrete will be buried by four feet of cover (Section 542.741) in the location shown on Plate 5-6.

Refuse Piles

Two rock slope tunnels will be constructed (Section 520). The permanent location of the mine waste from rock slope development and the location for the temporary storage of mine development waste is shown on Plate 5-2. Section 520 and 528.300 indicate that "a few hundred tons" of underground development waste, may be stored on site and transported for permanent burial at the Wildcat Loadout site.

Both Figure 1 and Figure 2 of Appendix 5-7 will be removed with the amendment. These figures illustrated the final reclamation contours with subsoil and topsoil placement over the refuse and "structural fill." This commitment to salvage and utilize subsoil for cover was addressed in the approved plan in both App. 5-7 and Section 232.500. In fact Chapter 2 still refers to salvage of subsoil for use in final reclamation as cover. The location for the Rock Slope Material shown on Plate 5-2 was mapped as XBS (Strych extremely bouldery, sandy loam 10 – 45% slopes) on Plate 2-3. This map unit has approximately 60+ inches of subsoil available, as represented by the pedon description of sample site LC3 in App. 2-3. This subsoil appears to have been used to form the base of the material storage and the coal storage pads.

Cut Fill estimates dated November 2007 were provided with the application. These estimates describe using excess cut from the haul road to construct the warehouse pad base (Sheets 7& 8). Sheet 9 describes excavation of the warehouse pad for burial of 28,000 cubic yards of mine waste. However, Appendix 5-7 no longer describes burial of the rock slope material in pits (neither in the voids created by subsoil salvage nor in voids on the constructed pad). Instead, the Permittee describes the placement of 28,000 cubic yards of excavated rock material in 24 inch lifts which will be compacted to form a pad. On September 9, 2009, Mr. Marshall indicated that the coal pad contains sandstone from the rock slopes and shale recovered from the pond. The warehouse pad contains sandstone and mudstone. (See discussion of rock slope chemical analysis below under Hydrology/ Acid-Toxic Forming Materials.)

The revision of Appendix 5-7 retains the requirement for covering the coal mine waste/refuse/rock slope material with four feet of combined subsoil and topsoil, under the heading "Spreading and Compaction."

Based upon the evaluation of the refuse to date (Appendix 6-2 contains one analysis and the second was received during an inspection on 8/20/2009), the Permittee will be required to provide four feet of cover over the mine development waste in compliance with the requirements of R645-301-553.252. The application alternately describes off-site disposal of all acid- or toxic-forming mine waste (Section 553.200 and 553.300) or transport to the Wildcat Loadout refuse pile (Section 528.300) or burial in a disposal area (Section 536) according to the plan provided in App. 5-7.

Findings:

The following deficiencies have been identified with the mine waste plans:

R645-301-731.300, Appendix 5-7 states that there are no acid or toxic forming wastes at the site. The information provided to date from rock sampling indicates otherwise and this statement should be removed from Appendix 5-7, p. 1.

R645-301-553.350, The application alternately describes off-site disposal of all acid- or toxic-forming mine waste (Section 553.200 and 553.300 and App. 5-7, p.1) or transport to the Wildcat Loadout refuse pile (Section 528.300) or burial in a disposal area (Section 536) according to the plan provided in App. 5-7. Transfer to the Wildcat loadout would require an amendment to the Wildcat plan that currently describes adequate cover for existing site requirements.

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HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:**Acid- and Toxic-Forming Materials and Underground Development Waste**

The Permittee outlines the testing of coal mine waste in Appendix 5-7. The Permittee will test all rock slope material five times, or about one test every 5,000 cu yds. The five tests will take place as follows: during the initial start up, at the ¼ mark, the ½ mark, and the ¾ mark and near completion of the rock slope tunnels. Samples will be analyzed for these parameters described in Table 1: pH, EC, SAR, boron, selenium, acid/base accounting, texture, water holding capacity, total nitrogen, nitrate nitrogen, and % organic carbon.

The first rock sample was taken on April 24, 2009. The analysis from the BYU Soil and Plant Analysis Laboratory was provided to the Division during an inspection. The analysis reports a sandy loam material with pH 8.2, an SAR of 6.67, a boron concentration of 0.45 ppm, and an unsuitable selenium value of 1.53 ppm. The second sample was taken on July 30, 2009 at an approximate distance of 450 ft. into the rock tunnel. This analysis was also received during a Division inspection. The BYU lab analysis reports a sandy clay loam material with pH 7.71, an SAR of 25.22, a boron concentration of 1.73, a selenium concentration of 0.75 ppm and increasing total sulfur content. During a meeting on September 9, 2009 at the Price Field Office, Jay Marshall mentioned reducing soil cover over the waste, but this is not advisable at this time. The SAR values of the rock slope material are extreme and the selenium values are unsuitable for use within the surface four feet.

Findings:

The information provided meets the requirements for identifying acid/toxic material.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

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Plate 5-2 shows the facilities to be developed at the site. Plate 5-2 shows the powder and cap magazine storage site on the topsoil storage pile. Section 520 describes mobile, temporary powder and cap magazines.

Plate 5-2 shows a Run of Mine (ROM) storage pile containing approximately 200,000 Tons of open storage. The Permittee has included in Section 520 of the MRP several means by which deposition of coal fines on undisturbed slopes will be controlled:

- enclosed conveyor from the portal to the ROM storage pile.
- 80 ft stacking tube to control the drop of ROM coal.
- jersey barriers to prevent encroachment against the canyon slope.
- ROM stockpile will be 8 inch minus.
- water sprays at the head roller to moisten the coal as it falls into the pile.
- in-line crusher with covered conveyor from ROM to loadout bin.
- water sprays at all transfer points.

In addition, the deposition of coal fines onto undisturbed ground from the ROM storage pile will be visually monitored quarterly (Section 234.220 MRP – Part B). The plan states that if monitoring reveals coal fine deposition, then water sprays on the open stockpile will be warranted as per General Condition #16 of the August 27, 1999 Approval Order (DAQE-702-99). In addition, if deposition of coal fines is persistent, then additional measures may be considered to prevent further coal fine deposition on undisturbed ground (i.e. wind fence).

Findings:

The information provided meets the requirements of the Regulations.

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The postmining land use is in accordance with the BLM's management plans. Appendix 4-2 contains a letter from the BLM stating the postmining land use for the area is wildlife habitat, grazing, and incidental recreation. Should these plans change, the Permittee will accommodate

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the landowner (BLM) and Emery County at the time of reclamation (Section 412.140). There has been no changes made to the post mining land use plans with the detail design change amendment (Task 3017).

The reclamation plan is presented in Appendix 5-8 and Chapters 2, 3, and 5 of the PAP. The site will be monitored for 10 years prior to final bond release. Should monitoring indicate that livestock grazing is detrimental to the achievement of bond release, fencing the site will be considered along with supplemental seeding. There will be no roads left in the disturbed area.

SUWA previously commented that the PAP fails to restore the land to a quality capable of supporting wilderness designation. In the 2003 settlement with the State of Utah, the Secretary of Interior agreed that public lands other than Section 603 WSA's and Congressionally designated wilderness could not be managed or otherwise treated as wilderness study areas, absent congressional authorization.

SUWA previously commented that the restoration plan is inadequate to ensure that the water sources and other wildlife habitats will be returned to the postmining land use. These issues are addressed in the reclamation section of this TA.

Findings:

Information provided in the application meets the minimum Postmining Land Uses requirement of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:**Redistribution**

The MRP describes in Section 241 grading the surface to Approximate Original Contour (AOC), replacement of subsoils in the root zone, ripping, replacement of topsoil, replacement of boulders and gouging and treatment of the surface with an inoculum. There have been no changes to these plans with the detailed design change amendment, Task 3017, other than volume of topsoil to be respread (66,000 cu yds). This volume of topsoil over the 34 disturbed acres will result in approximately 14 inches of topsoil replaced over the entire site.

The Permittee has provided Plate 2-3 outlining Soil Salvage and Replacement. In addition, the grading sequence is itemized in steps a through f. The sequence begins with:

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“a. Grade all areas where no subsoil is being stored. b. Replace subsoil on areas from which it was removed.” Comments were previously made that the sequence as written was very confusing. Crucial to the understanding of steps a and b in the regrading sequence will be the As-Built map (Section 232.500) that will provide the operational location of the subsoils suitable for placement in the top four feet rooting zone. i.e. subsoil from soil map units SBJ, DSH and VBJ is identified in the Order 1 Soils Survey. The As-Built map is referred to in the discussion of Section 241 and 242.100 and 232.500. The Division understands and follows the concept of salvaging the subsoil and documenting its placement for use at final reclamation.

Comments were previously made on the depth of topsoil replacement, with interested parties believing that the MRP called for eighteen inches of topsoil to be replaced over the entire site. Section 242.100 describes the replacement of topsoil to approximate the variable depth of topsoil encountered at the site during the Order 1 Soil Survey (see Plate 2-3 Topsoil salvage and Replacement). Section 242.100 also outlines the equipment to be used to replace the topsoil.

Re-establishment of biologic soil crusts will be attempted on the surface of the topsoil storage pile (Section 231.400). If successful, this source of biologic soil crusts will be utilized to inoculate the reclaimed site (Section 244.200). At the time of reclamation more options for cryptogam re-establishment may be available. For example, the U.S. Army Corps of engineers is experimenting with cyanobacteria pellets, which may be commercially available (see <http://www.cecer.army.mil/td/tips/product/details.cfm?ID=527>).

An inoculum will be applied to the reclaimed soil surface to re-establish bacteria, mycorrhiza and mycelium in the soil. The MRP is not clear on what product will be re-applied to the soil to re-establish bacteria, mycorrhiza, and mycelium (Section 241), however the Division expects that the best technology available at the time of reclamation will be employed, as per R645-301-333.

Amendments will replace lost soil nutrients based upon testing of the topsoil stockpile prior to redistribution (Section 243). Four or five Grab samples will be collected to a depth of 18 inches from the stockpile the topsoil pile height is reduced to approximately 10 feet at its deepest end. These samples will be analyzed for nitrogen, potassium, and phosphorus (Section 243) The This method enables measurement of the bottom and middle portions of the stockpile rather than the surface.

Appendix 5-8 indicates fertilizer application to the reclaimed surface will be based upon the testing of the topsoil. In past reclamation, the Division has noted that the application of nitrogen was a detriment to the encouragement of native species. The application of fertilizer may be detrimental to the establishment of micro-organisms as well. Plant nutrients should be applied only in the case of severe deficiencies.

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Findings:

The information provided in the application meets the requirements of the Regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

For this site, the Order 1 Soil Survey identifies microbial crusts on the surface of the soil. Microbial crusts stabilize the soil through protection of the soil from water and wind erosion.

The plan recognizes the need to re-introduce microbial life in Section 241, and specifies a method in Section 244.200. Section 244.200 indicates that if soil crusts form on the topsoil pile, they will be added to the wood fiber mulch application in an attempt to reestablish biologic soil crusts on the reclaimed soil surface.

The best technology for re-introducing cryptogams on a large scale is still a subject of research. The internet site www.soilcrust.org provides excellent references. Introduction of biologic soil crusts may be as simple as sprinkling the crushed organisms over the surface and irrigating as described by Jayne Belknap in the publication, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. The Permittee's commitment to advancing this research is commendable.

Appendix 5-8 Reclamation and Enhancement Plan describes the means of soil stabilization including: gouging of the site to encourage a roughened appearance as shown in Figure 1; and placement of large rocks and boulders and vegetation; application of 500 lbs/acre wood fiber mulch and 100 lbs/acre of tackifier with seeding and then a second over spray of 1500 – 2000 lbs/acre of wood fiber mulch with 100lb/ac of tackifier and 200 lb/ac of 16-16-8 fertilizer. Appendix 5-8 further describes the use of wood fiber mulch over topsoil.

In accordance with R645-301-244.300, rills and gullies that contribute to a violation of water quality or that disrupt the post-mining land use will be filled, regraded or stabilized.

There were no changes made to these stabilization plans with the detailed design change amendment, Task 3017.

Findings:

The information in the PAP meets the requirements of the Regulations with regard to stabilization of the soil surface and control of erosion and air pollution attendant to erosion.

RECOMMENDATIONS:

The Permittee has opted to preserve 8.7 acres of undisturbed landscape within the disturbed area perimeter. By the statements made in response to Task 3017, UEI accepts responsibility and potential consequences of this decision.

Cryptogams salvaged in December 2007 have been stored in open buckets in a cool, dark location, for use on the topsoil stockpiles. These cryptogams should be dispersed on the finished (north) side of the topsoil pile during the fall 2009 as described in the MRP Section 234.230. This operation must be completed before freezing temperatures limit the use of hydrospray.

Without delay, the undisturbed islands described in this application should be marked with signs (as described in the MRP Section 231.100) and protected by a 20 ft buffer zone (MRP, Section 234.220); the undisturbed islands should be protected with rock barriers and incidental rock distribution (as shown on Plate 5-2).